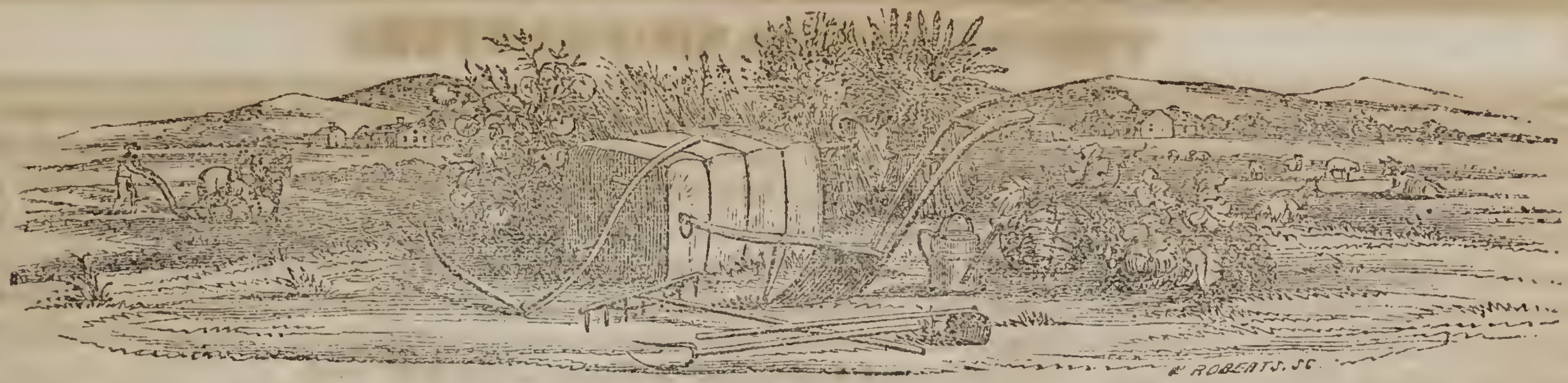

FARMER AND PLANTER.

DEVOTED TO AGRICULTURE, HORTICULTURE, MECHANICS, DOMESTIC AND RURAL ECONOMY.

Vol. II. PENDLETON, S. C., MAY, 1851. No. 4.

The Farmer and Planter
Is published monthly at Pendleton, S. C.,
BY GEO. SEABORN & J. J. GILMAN,
Editors and Proprietors.

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1 *copy*,	one year (*invariably in advance*)					$1
6 *copies*	one year, (directed to one office.)					5
25 *copies*,	"	"	"	"	'	20
100 *copies*,	"	"	"	"	"	75

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Pencillings by a Planter---No. 2.

I AM glad to see in the Planter a very able notice by H. W. RAVENEL, Esq., on the radiation of heat. This is as it should be. The agriculturist has just as much to do with the meteoric arrangement, as with organic chemistry. The atmosphere has its own climate, so has the earth. All is motion—re-action plays unceasingly in the physical world, and we may claim as a fact that the temperature of soils is in a certain relation with the temperature of the atmosphere, ever under the modifying influence of water, in the form of rains and snows.

Popular opinion that wet lands are cold, is correct. The application of a thermometer eight or ten inches deep in these wet soils, will at once prove the matter. The coldness depends on evaporation. There is always a loss of heat in the soil when the water is converted into vapor. The more rapidly evaporation goes on, the colder will be all surrounding bodies. This may be satisfactorily proven by letting water drop on the back of your hand, slowly. The hand soon becomes benumbed with cold, and it may be carried far enough to impair and even destroy the vital forces by this rapid extraction of heat, (or caloric). In making experiments on the temperature of soils, my plan is to put a spade its full length into the soil and lighten it up—put the bulb of the thermometer down into the loose earth about eight inches—let it stay fifteen minutes, being sure to press the loose earth around the instrument to keep off the influence of the atmosphere. The greatest difference between the temperature of any soil and the atmosphere occurs in the spring of the year; the earth at this season acquires an increase of temperature comparatively slow, from the fact of its losing so much caloric to dry the soil to fit it for vegetation. We may notice in our climate a sudden change from freezing to cloudy and warm, with a fall of rain, the temperature of which is commonly about 54°, the top of the soil is frozen, but the warm rain soon changes its temperature to a point intermediate between freezing and 54°. When soils become dry and warm, vegetation is often preserved by the accumulated heat, when the thermometer has suddenly fallen below 32°. We often see corn killed nearly to the ground while the root and a little above remains alive.—The soil gives off its caloric to the atmosphere, keeping a layer of warmer air near the surface. Early blooming fruit trees are often preserved from destruction by this radiation. But I am extending this article too long, and must quit this, to me, very interesting subject.

MARCH 7—The thermometer has fallen suddenly 30°, under the influence of a "norther," and it now rains in torrents, which will test my hill-side ditches as to capacity, &c. To keep from going out to get half drowned, or from hanging myself, or doing some other piece of foolishness—the scientific bumps being somewhat in activity—I will tell your readers something about the atmosphere.

The constituents of the atmosphere are, oxygen 20 parts, and nitrogen 80 parts, omitting decimals, and in these proportions the two gases are mixed to form the atmosphere. These are the proportions the Creator intended, and no more free oxygen was created. We have no doubt but these gases would mix in other quantities than the above, but the atmosphere holds its integrity from necessity, and all organic beings are constituted to these proportions. The composition of the atmosphere and its physical properties are subject to little variation, its weight is somewhat diminished in a ratio of motion. The physical properties of the atmosphere are of vast and curious importance. Its being a solvent of water, brings it in harmony with the functions and apparatus of living organic beings, showing infinite design in the all-wise Creator, in adjusting these conditions of life and the atmosphere.

The atmosphere is a solvent of water in a similar way that water dissolves sugar, its powers of solution are limited under certain conditions; the water exists in its interstices between its particles; but for this property the parched, stifling winds of summer, would dry up every fluid or hydrous being.

The atmosphere is, then, a body of æriform matter that surrounds the earth, extending upwards into space about forty-five miles. Its limits are fixed by two forces, the earth's attraction and its own elasticity, pressing upon the earth's surface about fifteen pounds per square inch. Refraction is the strong evidence that the atmosphere does not extend into space more than forty-five miles from the earth's surface. The sun's rays in passing through

the atmosphere imparts to it no heat.— This relation of the atmosphere to heat, is another proof of the wisdom in the design of creation. If it was capable of being heated by the transmission of the rays of the sun, the earth would be uninhabitable by the now existing race of animal and vegetable beings. The sun's rays pass through the atmosphere to the earth and are absorbed by its surface, from which it issues by radiation; the particles of the air next the earth become heated, and thus pass upwards by induction, or, still by radiation, from particle to particle. So that it can be readily understood that the air farthest removed from the earth, must of necessity receive less heat, than the air near the earth. This radiation goes on till it arrives at a certain height, when the uniform temperature is 32°. The height at which this takes place, is dependant upon the quantity of heat the earth receives from the sun. This being the fact, we should expect at the equator, the point of perpetual winter, to be much higher than in temperate climes, and so it is. At the equator we must ascend the mountains 15,000 feet above the level of the sea, before we reach the region of perpetual winter; as we approach the poles it gets lower and lower, till it finally reaches the earth at the ocean's level. There is another curious fact—atmospheric air when confined round a body is a non-conductor of heat.

Messrs. Editors, it still rains, and rainy days are wonderful aids of writing in extenso—this must be my apology.

J. P. B.

Corn Culture Again.

Messrs. Editors.—In your March number I see an article on the "Culture of Corn," signed "Root Cutter," and from the drift of it, suppose it is intended as an antithesis to the report of the Committee on corn, published in your February number. As Chairman of that Committee I will try to sustain it.

"Root Cutter" says he plants all his up-lands 5 by 3 feet. Now, unless all uplands are equally productive, this rule will not suit. The distance must be adapted to the fertility of different soils—e. g.: suppose there is a field to be planted capable of producing forty bushels per acre—can this field yield this product, planted 5 by 3? I think not. An acre, planted 5 by 3, will give 2,940 stalks, which would only make 22 bushels, supposing a perfect stand, and every stalk to produce one ear; so unless every stalk should produce two good ears, it would be impossible to reap the forty bushels.

"Root Cutter" says he covers corn with the hoe—I think this the worst implement that can be used for this purpose. Corn covered with the hoe almost invariably comes up badly, the dirt falls flat and heavily on the grain, the rains beat it down, and make it lower than the surrounding ground—the water settles on and consolidates the earth and prevents the egress of the grain. I have never seen any thing that equals the long narrow gopher, made of iron three inches wide and an inch thick, called in this neighborhood the subsoil gopher. The plough has many advantages over the hoe—it cleanses, loosens and revives the earth about the corn, and leaves a sharp, narrow ridge for it to come up through, which is not easily baked, places the corn on the higher ground, which renders it more easily and conveniently worked whilst small.

"Root Cutter" says, "It appears to me the roots and small fibres ought to be cut, for if they are not, the ground soon becomes matted and hard, and they will not render nourishment to the stalk; but if they are cut, they then take the second growth, and go in search of more food for the plant." Admirable logic!—something new in vegetable physiology. Are the roots non-essential organs? Does nature produce more than are essential for the support of plants? The functions of the roots of plants are to keep them in an erect position, and by means of their radicles and fibres imbibe nutriment for them, and to a reflecting mind it must be manifest, that for every removal of those *essentials*, there must be a concomitant diminution of the vital powers of the plant, or the nutriment imbibed is in the ratio of the scope of the roots. It appears to me, that for a plant to posess its full share of vitality, the roots must remain in-tact. It is inconsonant with reason and nature to cut the roots of plants to give them life and vigor—it is equally as absurd as to maim an animal to make it grow. How can "Root Cutter" advocate a deep preparation, and a root-cutting culture? Is it not the chief object of a deep preparation to give full scope to the roots? Here is an inconsistency—a place is prepared for the roots and are then forbid entrance—their sphere is restricted.

"Root Cutter" advocates hilling corn —this is equally as absurd as that of cutting the roots. I suppose, however, he is *compelled* to do this as he cuts off all the *supporters*. It is in opposition to the teachings of nature to hill-up. I can't see any benefit to be derived from it—but is a detriment to the plant as well as a loss of much labor. I think the surface should be kept level.

"Root Cutter" says, "A horse, a tree and a corn stalk are all of a different nature." We instituted no analogy between a horse and a corn stalk—but between a tree and a corn-stalk we did, in showing the absurdity of hilling up, and are they not analogous? Are they not both furnished with roots, whose functions are the same, viz: to support and sustain them?

We think all that is necessary in the culture of the crop, is to keep it free from any noxious plant, anything that will detract from its nourishment—stir often—keep the earth pulverent, the surface level and the roots *uncut*.

J. W. Crawford.

From the Albany Cultivator.

Humus.

No. 3, by I.

Plants are supposed in some form to derive their nourishment from a peculiar substance in the soil, called *humus*, and which is the result of the decomposition of other and previous plants. "Humus is described by chemists as a brown substance, easily soluble in alkalies, but only slightly soluble in water, and produced during the decomposition of vegetable matters, by the action of acids or alkalies." "Woody fibre in a state of decay, is the substance called *humus*." (Liebig.) There are various modifications of *humus* known to chemists; those which are soluble in alkalies are called *humic acid*, while the insoluble modifications are called *humin*. Dr Dana applies the name of *geine* to this substance, and divides it into soluble and insoluble geine, and considers that in the three states of vegetable extract, geine, and carbonaceous mould, is the principle which gives fertility to soils, long after the action of ordinary manure has ceased. He pronounces it to be the "decomposed organic matter of the soil." That *humus* owes its origin to decayed vegetation, can scarcely be questioned; but the manner in which it produces the fertilizing effects on the soil, or rather in what manner it is made subservient to the growth of plants, is a question which is exciting no little interest, and is certainly one of importance to the farmer as well as the vegetable physiologist. The more common opinion has been, that *humus* was no further available than it was soluble, and that in this state it was taken up by the roots of plants, and converted by their vital action into the substance of the plant. Others, and among these are the celebra-

ted chemists, Liebig and Raspail, maintain "that *humus*, in the state in which it exists in the soil, does not yield the least nourishment to plants." That plants *may* receive some nourishment from *humus*, in the shape of humates, or humus combined with an alkali, such as humate of lime, would seem probable, as such humates become soluble in water; but the ingenious experiments of Liebig prove that but a small part, if any, of the nourishment of plants is actually derived from that source. Humus, then, must be available in some other way than by actual absorption by the roots, and this way, Liebig contends, is by its gradual conversion into carbonic acid gas. Several furious attacks have been made on the German chemist, for his assertion that humus, as it exists in the soil, is of no avail to plants; but if humus is only the decayed matter of plants, it is clear that, no matter how fine its particles may be, it must undergo some change before it can be taken up by the plant, or be converted into nourishment in any way The modern doctrine is, that plants derive most of their nourishment, or in other words, the carbon which constitutes the most of their structure, from the carbonic gas of the air, and that humus is only or chiefly useful in furnishing a constant supply of this gas for the use of the plant. It seems to us, however, that as carbonic gas is readily soluble in water, or combines with it in large quantities, that in this form it is presented to the roots of the plants, and appropriated by them to their growth or nourishment, as well as from the air by the leaves. This opinion is sustained by the remark of Liebig, that every root and leaf acquired by the plant, gives it a new mouth and stomach. Common manures, such as are derived from vegetables principally, are of little use until decomposition has been effected, and the formation of carbonic gas has commenced. Those manures in which the nutritive and stimulating properties are combined, or those in which ammonia exists with the carbon, are found to be the most efficient and the earliest in their action on plants. The prepared manures belong to this class.

Cotton Planting and Cultivation.

Messrs. Editors:—I hope your readers will be willing to put up with my way, it is not after the way of making books, but I am no book maker, and as I labor purely to aid, I hope my frailties will be overlooked. I dare say your readers are like others, they do not want the trouble of the fanning mill, or to crack the nuts, but if they follow me they must winnow out the chaff, and may be they *may* find an occasional grain. This will be advantageous, as thus they will acquire habits advantageous. I gave you in my last a mess on oats, believing as I do in their great economy both for horses and hogs. Yet I must apprize you of two things I have thought were objections, the most important—green oats will kill sucking colts; and I have thought my team panted and sweated more under a full oat feed, than I had ever seen when fed with any thing else. And yet another thing—I cannot regard either the Egyptian oats, (sown in October and November) or any of the spring oats, as a winter food for horses. I saw the opinion of Dr. Lee, of the Southern Cultivator, and do not agree with him. Green oats will do well lor young cattle, hogs and milch cows, but I prefer dry food for horses—rye is much better—barley I am now testing.

The cow-pea family I need not urge upon your readers as a vast aid in fertilizing land. Sow them so as to produce vine, make the pea a secondary object. Why will the shade for July, August and September, not be of value to the soil?—We know that covering the earth with a pile of bricks or lumber, or straw, &c., will show a decided advantage—the result must be from shade and exclusion of light.

Let it be continually borne in mind that deep tilth and a thorough inversion of the top soil is necessary to complete success; and even this will be only partial unless the land is placed in condition to take off all superfluous water. Land thoroughly drained will carry a crop through a drought to more advantage than the opposite—the land retains moisture, and the air has free access. This circulation is necessary. Why should not some gas be deposited or drawn from the air? And the cooling of light and porous earth causes a deposit of dew throughout the whole extent of the depth of culture.

The culture of cotton has absorbed every faculty, and I doubt not that many of your readers who would realize more comfort, and make more money by a stock or grain farm, by the dairy, &c., will continue to strive for cotton. This is the worst of bad management. Turn your attention to something else, and leave the cotton growing sections of our country to fret and toil and make cotton their eternal study.

Many of us by a little more devotion, could make from eight to ten bales of 400 pounds, as easy as some of your folks can make four. I am aware you look upon this as Buncomb talk—but not so, I have made this year, even, and no cotton planted till 16th of April, (having had to clean up, &c., for extra hands, after 1st March,) six bales per hand, as my hands are rated by my overseer, I have made seven per hand—my hands being mostly children. I can certainly cultivate ten acres to the hand, I have done it, and even twelve acres. The latter would give me, even at this year's yield per acre, nine bales. In 1847 from eighty-one acres, cultivated with nine hands I made eighty-three bales. But you will make cotton, and I might as well say to you, here we must plow well and throw up good beds; we endeavor to have rows quite straight on level land, or a very gentle curve on hilly land. Beds are harrowed over, and opened with an opener about a half to three-fourths of an inch deep, very narrow furrow; the implement being a piece of timber three feet long, three inches square, and cut down to a sharp edge, so as to represent a triangle; one edge of this angle should have a one-fourth inch iron rod, fastend by turning at each end, so as to prevent wear; sow the seed thin, not over one bushel per acre, and cover with a heavy block. Cotton is stronger and more healthy when it is scattering, it will stand thus a frost that will nip corn blades.

I use next a scraper, to shave the bed on each side of the row; with moderately raised beds the earth is readily turned to the middle of the row. The hoe hands, large and small, can average from one to one and a half acre per hoe. I begin to scrape when a stand is up. I prefer keeping land clean to cleaning it.

My plow-hands follow with bull-tongue plows. I usually earth as I scrape, never letting the hoe-hands be out of one field a day before the plows leave it—I think it best. Dr. Cloud, and one or two others, hold another mode best. But take one hundred acres and twelve hands, and we will see. To manure as Dr. C. says is necessary, we would only want say fifty acres, and it would require twenty hands all the year to manure. I admit all the advantages of manuring, and that four acres per hand *might* give a full crop, say even eight bales, and that hands could then pursue a different plan. But where eight to twelve acres of cotton are planted to the hand, I doubt if scraping with the plow and hoe can be dispensed with to advantage. I prefer earthing with a bull-tongue, called by many a scooter plow, first that the earth is very nicely put to the young plant, and secondly, because there is only a narrow ridge left, from which super-abundant moisture can pass to the furrows each side, and thus admitting the ridge to become much

warmer. This year cotton that was earthed early, died—a thing I never saw before.

The after culture of cotton is mainly to keep clean. But I keep my hoes scraping, my plows, of course, throwing earth to the cotton. I plow late, prefering to risk breaking a few limbs, to laying by early. And I prefer anything to cultivate with to the turning plough.

Yours, &c., M. W. PHILLIPS.

Transplanting Cotton.

AT THE last meeting of the Agricultural Society, the subject of transplanting cotton came up, and an intelligent and practical planter stated that he had transplanted the cotton plant with as much success as any other plant. We see no good reason why it cannot be done, to fill out a missing stand. Of course the ground must be wet and the sky clouded. In putting in the plant care must be taken not to cramp the roots. Three hands to the row would do it admirably; let one go ahead with a hoe, and make a hole for the missing plant—another to drop the plants, and the third to plant. In this way a field would soon be gone over, and there would be very little difference in the maturity of the stalks. In a season like the present, when the stand is universally poor, it is worth the trial. If tobacco can be transplanted profitably, surely cotton can. We shall not be surprised to see cotton plants started in hot beds, and transplanted in the open fields. What an immense advantage if it does succeed; it can be done in less time than it takes to chop out, and may secure the early maturity of the plant. Try it, planters, and we shall hear no more talk of half a stand of cotton.—*Columbus Enquirer.*

From the Albany Cultivator.

Theories of Agriculture.

CONSIDERABLE advance has of late been made in the *philosophy* of agriculture.—Until within a few years, the practice of husbandry may be said to have rested entirely on empirical rules. The subject has now been greatly illustrated by scientific investigation. In vegetable physiology, we have been much aided by chemistry, by which the functions of plants and many of the phenomena connected with their growth and decay have been explained. Analysis has shown the composition of plants and soils—it has shown that each species of plant has its specific food—that the elements which support plants are not uniform in the soil, but that each variety of soil varies in this respect. Thus we discover the principles from which are deduced the necessity of the application of manures, and the expediency of a rotation of crops.

But it is not alone by explaining acknowledged facts, that chemistry has thrown light upon agriculture; it has solved questions, by which practice has seen, in some instances, corrected. We are aware that too much has been claimed for chemistry—that some of its enthusiastic advocates have assumed much which would not stand the test of experience, and which is equally at variance with correct science; but this is a result naturally incident to all investigations in their first stages, or until their fundamental principles are thoroughly established.

On the other hand, an unreasonable extreme has been run into by the opponents of the application of chemistry to agriculture. For example, an editor of a paper whose leading subject is agriculture, declares that "for a farmer to consult a chemist to aid him in his field, is more absurd than for a smith to look to the wind to know when to temper his tools."* The same editor informs us that nine years have elapsed since he first "invited the public to patronize a paper of a character wholly different from any that had been published since the art of printing was discovered," and that he has "labored hard to please and instruct." As specimens of these labors to "instruct" farmers, we may take the above remarks, and also his assertion put forth through the same medium, that the *shape* of the plow has undergone no improvement for the last thirty years—that "the only improvement in draft is owing to the smooth and hard surface of the plow—land-side and furrow-side; for plows turn the land over no better now than they did thirty years ago."

Now it seems to us that every farmer whose vision is not blinded by prejudice or ignorance, may have discovered various instances in which chemistry has been of practical utility to agriculture—that it has developed valuable truths which never could have been elicited by practical observation alone. Without the aid of chemistry, it could not have been discovered that phosphate of lime formed one of the constituents of bones, of milk, and the cereal grains. Milch cows when confined to pastures which have long been devoted to this description of stock, are liable to a weakness of their frames called the "bone disease," and their milk is sometimes destitute of a quality essential in the manufacture of cheese.—Chemistry has ascertained the cause of those defects, and pointed out a remedy; it has shown that the soil becomes exhausted of its phosphate of lime, so that the herbage does not afford the animals the requisite supply of this important element; and as the same science had shown that bones were composed chiefly of the substance wanting, it only becomes necessary to apply bones as manure, to remedy the defect of the soil and heal the malady of the animals.

Chemistry has been of practical utility showing in what consists the fertility of soils, what constitutes the fertilizing nature of manures, and what is the specific action of various substances. In this way it has been the means of correcting erroneous practice in compounding manures. Formerly, farmers, without any knowledge of chemistry, were in the habit of mixing all kinds of manure in a compost, without regard to their action when thus combined—apparently on the principle that "too many good things cannot be put together."—Lime was too often mixed with animal manures, and, as chemistry has shown, to the loss of one of the most valuable properties—ammonia. Hence, those who understand the action of lime, have discontinued its use in manures. Thus, Prof. Johnston says guano should not be mixed with lime,—"because the lime sets free the ammonia contained in the guano, and causes it to escape into the air." He says, also, "quick lime will in the same way drive off the ammonia contained in liquid manure, and in horse, or farm-yard dung." Another writer observes—

"Lime is frequently misapplied by being added to farm-yard manure, animal remains, and other substances which are rich in ammonia. As it encourages the decomposition of the structure of animal and vegetable substances, it has been used for this purpose. This is, however, an erroneous practice, as it effects its object at the expense of the most valuable fertilizing element, which it dissipates. But practice does not require the aid of lime in the conversion of of the remains of animal bodies, of vegetable refuse, and many of the occasional waste substances which contain ammonia, into compost manure. They rot spontaneously with sufficient rapidity."*

The injurious effect of mixing lime with animal manure, may be explained as followers: Limestone contains nearly half its weight of carbonic acid. In the process of burning, the carbonic acid is driven off; but the lime has a constant tendency to return to its original condition, by the re-absorption of the property it had lost. Animal manure contains this property—carbonic acid—combined with ammonia. Thus, when lime and manure are mixed, the strong attraction which the lime has for the carbonic acid, causes the latter to separate from the ammonia, and unite with the lime, liberating the ammonia, and allowing it to pass into the air.

Chemistry has also shown that sulphate of lime, (gypsum,) has an opposite effect from common lime, when mixed with manures. The sulphuric acid of the gypsum unites with the ammonia, (which is an alkali,) and prevents its escape. Thus, where caustic lime would produce a loss of the most valuable property of manure, sulphate of lime would save it.

The observance of the principles which have been developed by chemistry, merely in relation to the action of lime and gypsum, as above noticed, might have saved to farmers thousands of dollars, which, for want of this knowledge, have been lost. In this connection it may be mentioned, also, that the science has been of great utility in ascertaining the intrinsic value of what may be termed *commercial* manures—as guano, poudrette,

* Massachusetts Plowman, Oct. 5, 1850.

* Mortons Encyclopædia of Agriculure.

&c. It is well known that great deception has been practiced in regard to these articles. Chemical analysis has shown their adulteration, and established their true value; thus enabling farmers to avoid imposition.

Again, chemistry has greatly illustrated and explained the advantages of draining land. True, it could be seen without a knowledge of chemistry, that crops grew better for having the surplus water turned from their roots; but this science has shown that an undue quantity of water in the soil causes the formation of noxious compounds. It prevents the decomposition of vegetable substances, in consequence of which, acids are generated, sometimes with iron as a base, which are very prejudicial to plants —the soil becomes *sour*.

Chemistry has detected these acids, shown their nature, how they were formed how their formation may be prevented, and how they may be destroyed. It shows that draining produces a chemical change in the soil; that the water being withdrawn, and the soil exposed to the action of the air, these injurious acids are dissipated, and the food of plants, which had before remained latent, becomes soluble and available. This is unquestionably one of the most beneficial results of drainage, and yet it is one which chemistry alone could explain.

Chewing the Cud.

A LITTLE time since, says the Prairie Farmer, we noticed a communication in some agricultural exchange, in which the writer affirmed that ruminating animals did not masticate their food the second time, but that the cud which they are observed to chew is carried under their tongues in a little nich provided there for it; and that their chewing is a kind of operation very much like that of a tobacco chewer. Whether such a notion accords with facts better than the statement appended, such a genius could himself judge; the statement is from Ruschenberger's Mammology.

"When these animals (ruminants) feed, they swallow their aliments, at first, without having chewed them. These substances then enter into the paunch, and there accumulate; thence they pass into the second stomach, (reticulum); but after having remained there for a certain time, they are carried back into the mouth to be chewed, and afterwards swallowed again, and when they descend again into the stomach, they no more enter into the paunch or reticulum, but go directly to the *manyplies*, (third stomach) from which they pass into the fourth stomach, or *rennet-bag*, where they are digested.

At first, one is astonished to see food pass at one time into the paunch or reticulum, at another into the *manyplies* or third stomach, according as it had been seen swallowed for the first time, or after it has been regurgitated; and one is tempted to attribute this phenomenon to a sort of tact with which the openings of these different digestive pouches seem to be endowed. But there is nothing of the kind; this result being the necessary consequence of the anatomical arrangement of the parts. The œsophagus teminates below in a species of gutter, or longitudinal slit, which occupies the upper part of the reticulum, or second stomach, and the paunch, and is continued to the manyplies. Ordinarily, the edges of the slit of which we have just spoken lie close together, and then this gutter constitutes a perfect tube which leads from the œsophagus into the manyplies, but the alimentary ball swallowed by the animal is solid, and somewhat large, it somewhat distends this tube, and separates the edges of the opening through which the œsophagus communicates with the two first stomachs; the food falls into these pouches; but if the alimentary ball be soft and pulpy, as is the asee when mastication has been completed, the matter swallowed enters into this same tube without separating the edges of the slit, and reaches the third stomach.

It is by this mechanism that unchewed food, which the animal swallows for the first time, stops in the paunch and reticulum; while, after it had been chewed a second time, and well mixed with saliva, it penetrates directly into the manyplies.

The mechanism by which aliment accumulated in the first stomach is carried back to the mouth, is also very simple. When regurgitation begins, the reticulum contracts, and presses the alimentary mass against the slit-like opening which terminates the œsophagus; then this opening enlarges, so as to seize a pinch or portion of the alimentary mass, compresses it, and forms it into a small pellet, which enters into the œsophagus, the fibres of which contract successively, from below, upwards, to push forward the new alimentary ball into the mouth.

The Cherokee Country, Again.

MESSRS. EDITORS:—In the February number of the Farmer and Planter, I have read an article under the caption of "Tho Cherokee Country of Georgia," over the signature of I. S. Whitten. Mr. W. informs us that he has spent a part of three summers in passing through, and enquiring about the country, and has come to the conclusion that it requires a peculiar cultivation, to make our lands profitable, notwithstanding they are very fertile, and yet it requires too much manure to keep them up. His first objection to our country is, in consequence of our latitude not being able to compete with the best cotton growing sections in the production of the article. Now, Messrs. Editors, we folks of Cherokee all know, and so may any person know that is acquainted with the culture of cotton, that we don't raise the finest staples, nor perhaps such abundance per acre, yet we can make cotton culture a tolerably profitable business. You can judge for yourselves Messrs. Editors, when I inform you that we can make from one thousand to fifteen hundred pounds per acre, and we have the same markets for our produce that Mr. W. has and our facilities are pretty good to boot. Mr. Whitten goes on and says, though our lands are so fertile he has never seen a bushel of fine white wheat, it was all dark, or red, and generally badly filled. The fine, white wheat alluded to by Mr. W., we suppose, is raised in great abundance in Hancock county, where he resides; we have none of those white varieties, and, therefore, have to content ourselves with our dark varieties until we can do better. I will give you the names of some that we raise, and perhaps you can tell us where we can get a better sort: we have the Yellow Lamus, late Blue-straw, early Blue-straw, Flint, Red May, Mahala, French Bloom, and some others. Now perhaps you can tell us how to make better selections—for my part I think all the varieties ennmerated make very good flour, as our best brands, in market, command better prices than *free-soil* flour; and I expect, too, that Mr. W. likes occasionally to get hold of a biscuit made of the flour from this dark wheat. We dont pretend to say to you, Messrs. Editors, or any one else, that our soil and climate is capable of producing wheat in that purity and abundance that the North-western States can, yet we think there may be some profit derived from the culture of wheat in Cherokee Georgia—Mr. Whitten to the contrary, notwithstanding. Now something about the grasses—Mr. Whitten says, that although our lands are so rich and calcareous, he thinks it much more expensive to get them well set in perennial or turf grasses than East Tennessee or Kentucky, and less lasting when turfed. As to the grasses our experience is limited; but one thing we know, it has been said by persons from Tennessee, that they thought the grasses and clover, would thrive and do finely here, and we suppose persons that are acquainted with the culture of the grasses, would be as capable of judging of the adaptness of our soil for that purpose as Mr. Whitten. And moreover there are a few lots of both grass and clover in our acquaintance, which seem to promise success to the owners; and, what is more encouraging, there are a good many of our enterprising farmers about to make a test of this valuable part of agriculture, last or no last. There has been several bushels (and I don't know that I would exagerate if I were to say barrels) of grass and clover seed sold at our depot, during the past fall and spring, at a considerable cost, being from six to seven dollars per bushel—so much for the grasses. Mr. W. then gives us the kinds of grain, &c., that, in his judgment, is best suited to our calcareous and humid soils. He thinks it is finely adapted to corn, oats, Irish potatoes, and it may be tolerably good for rye, turnips and fruit. Mr. W. begins now to talk with some judgment. We can raise the above named grains admirably —but here we are again discouraged, when we think of the calcareous qualities of our soil and the great quantity of manure it requires to keep them up—and he thinks it is too expensive and would impress upon the minds of those substantial business men of Carolina and Georgia, that there is great danger in purchasing or settling in Cherokee Georgia, the land is too calcareous

and hard to keep up. They had better, if emigration is their notion, move to the fruitful hills of middle Georgia, to old Hancock in particular.

Messrs. Editors, there is something strange about Mr. Whitten's communication; he seems with one breath to speak in the highest terms of our fertile country, and with the next to disparage. He also takes great interest in warning the citizens of Carolina and Georgia from settling on those calcareous and humid lands.—Does Mr. Whitten suppose that Carolinians and Georgians have no judgment of their own? or does he suppose his judgment to be superior? or is he fearful they may emigrate here without first viewing the country? He certainly has some motive in view—it may be to elicit a description of our climate, soil, productions, &c.

Respectfully, yours, J. C. D.

Adairsville. Cass Co., Ga.. March, 1851.

Agricultural prospects.

Messrs. Editors:—As my business has called me through this, and several of the adjoining districts, I will give you a short statement of our agricultural prospects. Our rivers and creeks have been very high, it is said by the old people, on the great Peedee, that the freshet in March was the highest since 1792. It swept away all the fencing, and many of the dams, carrying fodder stacks, negro houses, and, in short, every thing moveable, ahead of it; this, of course, will make them late in planting of the river lands, and likely much that was intended for cotton will now be put in corn. The upland planters have got corn pretty generally up, and are making large preparations for planting of cotton. I fear too much cotton is to be planted for the good of this community. Negroes hired very high, from $100 to $150 for good field hands for the year, and of course large cotton crops must be made to meet the price. Grain crops look well, and owing to the very short corn crops last year, we planted largely on wheat, oats and rye. This will make up to a great extent for the want of corn through these districts. We have had some cold weather since our fruit trees have bloomed, but I think they have passed through unhurt, and from every prospect I think we may expect abundant fruit crops this year.—Farmers are generally out of debt, and money matters are now easy. We had little or no suing at this court, and if any portion of our people have a right to complain, it must be the lawyers, poor fellows it is the gloomiest times they ever saw.

Yours, respectfully,

J. E. Byrd.

Darlington, S. C. April, 1851.

Meteorological Observations---No. 3.

Messrs. Editors:—It is certainly a favorable augury that in naming your bantlin, you gave the farmer first, hoping in doing so it was no accident, and one of your friends, at least, wish for the young one a vigorous manhood and a green old age—hoping that even after having lived to honor its country, its friends and its parents, for the usual allowance of "three score and ten," that its ashes may be scattered to the four winds of Heaven, and thus fructify and invigorate wherever one atom may fall.

But, Sirs, I am not so certain but that an electronometer, an instrument to show the free electricity of the air, will be more advantageous than most of meteorological implements; and to the farmer we must look for experiments, data, facts, &c., the planter looks on all this as small potatoes used to be regarded in Ireland—as no great things. It is said by those who have studied this matter—one word would have given the meaning of the last six, but it is book learning---the earth is in a state of negative electricity, the air positive, usually. (the latter varying).---in calm and serene weather, it is constantly positive, yet having as it were ebbs and flows; much of this is stated differently by different experimenters.---The hydrometer, to test the degree of motion in the atmosphere' will aid somewhat, as electricity is much influenced thereby.

Some writer states that there is a want of electricity in a house where there is a dense shade, or in dark places, caverns, &c., or to this effect. May not this explain why our women, who sit in dark rooms lest they injure their complexion, are so feeble? May it not account why citizens residing on one side of a street in certain localities, are more subject to certain diseases?---cholera, for instance. And may it not be that positive electricity is injurious to vegetation? as we know that nitre is found in such places, where positive electricity does not exists. Admit that all this be sheer theory, will not examination made by several thousand throughout the United States, give to those who are versed the means of arriving at much certain knowledge. We can certainly arrive at beneficial results to the agricultural interest. Our own senses learn us much if we will only attend. Have you never noticed how sound is communicated at times? Have you never noticed, on clear days, the difference in the color of the air, the hight of the stars, &c.? All this put together, will teach us to be provident, and at times save us very much labor, as I can illustrate at this very time: I had fifteen or twenty hands rolling and firing logs, had I been governed by my judgment, I would have saved half my labor, for in ten hours or less they were deluged.

Yours, truly,

Joachim.

Soap Making.

In a conversation with some of our good housewives, recently, we discovered that although they did not believe in the influence of the moon, of witches or other evil disposed spirits, yet they were at a loss to know how it was they failed at times to make good soap, even where the ley was sufficiently strong to float an egg, the domestic hydrometer and test that is usually applied. We stated to them the cause of failure, and pointed out the remedy. But as we may not have the pleasure of a familiar conversation with all our fair readers that may desire information on this subject, we select for our present number an article, originally from the Genesee Farmer, that if properly attended to, will prove to be of more value than many times the price of a yearly subscription to our paper.

We will take occasion here to remark, if parents would, in the education of their daughters, give them some knowledge of kitchen chemistry instead of, or in addition to a smattering of French or other branches that may be of no future use to them, they would thereby arm them against many disappointments and anoyances in their future domestic operations.

"It wad frae monie a blunder free us,
And foolish notion."

"As this is the season of the year when most of our housekeepers attend to making soft soap for the use of the family, we trust a few observations may be acceptable.

Much difficulty is frequently experienced in this business, and many *vulgar errors* have been connected with it; and we have heard women declare that they believed their soap was bewitched.—When the principles are once understood, the whole process is easy and simple.—First, then, it is proper that housekeepers should know the properties of the component parts of soap.

There are two fixed alkalies used in soap making, viz. potash and soda. Potash is called the vegetable, and the soda the mineral alkali; either of these alkalies will unite with grease and form soaps: potash and grease form soft soap only, but soda and grease make hard

soap. Both these alkalies have a strong affinity for acids—uniting with them and forming what is generally called neutral salts. Thus potash and nitric acid form saltpetre; soda and sulphuric acid form glauber salts, and soda and muriatic acid, or spirits of salt, form common salt.

Now, no woman in her senses, would think of making soap with either of these salts; and yet the base of either, when separated from the acid, would form when mixed with grease, as good soap as if they had never been united.

There is also another acid which combines with these alkalies, which will equally prevent their uniting with grease, as either of the before mentioned acids—that is carbonic. Now this acid is continually floating in the atmosphere unseen, and will combine with potash or soda whenever it comes in contact, forming a carbonate of soda or potash—neither of which will unite with grease to form soap.

Much of the difficulty which housekeepers meet with in soap-making, arises from their ley having become more or less saturated with carbonic acid. Ashes which have long laid in a damp place, or become damp by other means, will absorb carbonic acid, or if the ley is allowed to stand too long, after it is leached, in an open vessel, the same thing will take place. Lime is often placed in the bottom of the leach, and but few can tell why they do it. If the question is asked, the reply is—because it makes the ley cleaner. Lime has a stronger affinity for carbonic acid than potash has, and of course will separate from it. Common limestone is lime and carbonic acid: when limestone is burned in a kiln, the carbonic acid is separated by heat, and quicklime is formed. Now if this quick or fresh burnt lime is placed in the bottom of the leach and ley made to pass through it, it becomes purified from the acid, and the only thing necessary then to have it unite with grease, is to have it of sufficient strength. This may be ascertained by its specific gravity—to learn which, put a new laid egg into it: if the egg floats, the ley is strong enough; if it sinks, the ley must either be evaporated by boiling, or by again leaching it through the ashes. The grease made use of, is the refuse fat of animals, and before it is united with the ley, should be freed from all the salt by boiling it in water. The quantity necessary for a barrel of good soap, is about sixteen pounds, or half a pound to a gallon.

Soap, when new made, should be thick and salve-like, capable of being spread thin upon cloth without flaking or rolling off. If to such soap, about an equal quantity of soft water is added, the soap becomes hard and liver-like, capable of being taken up in the hand. This, many think, is desirable,—especially the soap-boilers who make it for sale, as they make double the profit they would on the other quality.

Some housekeepers practice making their own hard soap. This is done by adding salt to the soap after it is well made, while it is yet boiling. The effect is thus explained. Salt is soda and muriatic acid. Potash has a stronger affinity for muriatic acid than soda has, and when they come in contact, as in this case, the potash decomposes the salt and combines with the muriatic acid, forming a muriate of potash—leaving the soda pure to form a hard soap with the grease:—the muriate of potash will be found, on cooling, in solution at the bottom, being of greater specific gravity than the soap. The salt should be added in small quantities until the separation takes place, which may be known by the soap becoming curdled; after which, it should be allowed to stand until cold, when it may be cut into bars or cakes, as suits the operator. Many suppose that resin is necessary to harden the soap. This is not the case; it is used as a matter of profit—not of necessity.

The common yellow color of soft soap is owing to the iron contained in it, as the oxide of iron is dissolved by potash. Where white soap is desirable, it may be made by substituting pearlash or carbonate of potash, and abstracting the carbonic acid by lime—and by using lard or other white grease, the purest white soap may be made.

Food of Plants Again.

Messrs. Editors:—In compliance with your request, I send you the following communication in vindication of the opinions I entertain, that plants do not absorb carbonic acid by their leaves. These opinions have been formed through close observation of their habits and physical structure, as well as by experiment.

When young a part of my business, as of every other farmer in the region of country where I was then located, was that of boiling maple sugar, in the spring time of year. In connection with the flowing of the sap from the maple tree, is this phenomenon: It always flows briskly and free with a west wind and clear sunny day, but should the wind change to the East or South, and the sky become overcast with clouds, it ceases running, nor is it renewed until a return of the weather to the before mentioned state. You will perceive from this, that so long as evaporation is carried on freely from the earth, the flow of sap is abundant, and that when it ceases, so does the running of the sap from the tree.—Hence I infer that so long as there is a rapid evaporation of the redundant water or its elements from the tree through its bark, young leaves and buds, there must necessarily be a corresponding acceleration of its motion to supply the vacuum thus caused. These facts are well known to every one who is conversant with the business of sugar boiling. The sap taken from the limbs and branches some twenty or thirty feet from the ground, is much sweeter than near the earth, showing clearly that it has parted with a greater portion of its water; and if the tree be examined a few weeks after the season of flowing has ceased, the sap is found to be in a state resembling gum or mucilage and from gum, to perfect wood or lignum. A large sized maple tree will frequently afford sap sufficient in twenty-four hours to make two pounds of sugar. The sugar thus made is a compound of carbon and water alone; and the sap is usually collected from the tree before a leaf is formed upon it. It certainly could not have been absorbed from the atmosphere by the leaves, for the tree had none. As a further experiment, cut off a grape vine near the ground when it is filled with sap, and I would not be surprised if enough should be collected to afford carbon equal in quantity to the whole of the carbon in the vine cut off. The carbon thus furnished could not have been taken up by the leaves, for it has not even a top, much less leaves, to collect it from the atmosphere.

I have examined the growth and formation o[f] sap vessels and wood of the common chesnut tree, every month in the year, by cutting a chip from it, and find the foregoing to be the modus operandi of transition from sap to perfect wood.

Next let us examine the structure of the leaves of the common corn, (*zea mays*) the Dahlia, and the apple tree, all dissimilar in their appearance, and endeavor to ascertain their office and habits. We find the corn blade to be large, showing the plant to be of a succulent character, requiring a large supply of water to facilitate its growth; the upper side smooth, and as it were varnished, with a mid-rib, channeled or grooved, running its entire length, with the base wrapped around the stalk forming a spathe, the under surface of the leaf being hirsute or rough. The structure of the upper-side indicates that its office is to collect moisture, of which a portion runs down the groove in the mid-rib into the spathe, which is always wet in the interior around the stalk.—The leaf hanging in the form of an arch, a portion of the moisture it collects, is poured off at their points and falls near the extremities of the roots. The constitution of the plant requires the spathe to be kept continually moist, for as the stalk grows above it and comes in contact with the air, its silicious coat soon hardens and becomes incapable of further expanding or increasing in size. The under side of the leaf we find, as you observe, filled with innumerable small pores or orifices, not, as I conceive, to collect food from the falling dews and rains, because, if that were the purpose for which they were intended, they would have been placed on the upper instead of the under side, as they would more readily meet with a supply.

The reason why the twisted or rolled leaf so readily expands on the approach of falling moisture is, that it may the more readily secure what falls upon it, and carry it to the parched spathe and roots. Let a leaf which is rolled up during the day, be examined early in the morning, and we uniformly find it spread out, with the drops of dew on its upper surface, if any has fallen during the preceding night. If the office of the under side of the leaf was to imbibe moisture and carbon, it would remain [illegible]
night, as it wou[illegible]
tact with it then, than [illegible]
plants have no nervous sys[illegible]
cover, yet they possess a s[illegible]
under given circumstances, [illegible]
moisture may be the excitin[g] [illegible]
rolling of the twisted leaf. [illegible]

drought has the effect also to obstruct the orifices of respiration in the leaves, by exciting undue excretions of saccharine or gummy matter, as we see in honey dew, as it is called, which only occurs in the greatest heat of summer, and during extreme drought, and altho' a slight rain may not reach the roots of the plant, it may be the means of removing these obsructions upon the leaves, to the healthy performance of their functions; and further, we find these slight rains produce a very temporary relief to the suffering plant, in comparison with one that is ample.

The offices of the leaf of the dahlia are not less distinctly marked than those of corn. We find them lobed, with a long grooved foot stalk, the angles of which run entirely round the main stalk and join with one of like character on the opposite side, thus forming a receptacle or cup around it. This receptacle is nightly filled with water which falls on the upper side of the leaf, runs down the foot-stalk, and fills it. And for what purpose? To soften that part of the stem that a bud may be thrust out more easily, to form a future branch or limb, which it invariably does. In some plants, of similar structure, after the branch has commenced growing, the leaf falls off, as it has then perfected its intended purpose. A person can very easily perform a very interesting experiment of making branches grow at will, on a tree, as follows: prune off most of the top so that the tree becomes surcharged with sap, then upon a smooth place on the limb or trunk, stick a bit of oiled paper with a little varnish, so as to make a small cup or receptacle, in which put a few drops of water, several times a day, and at sunset, the water being in contact with the bark of the tree, softens it, and a branch is soon seen to start from it. The dahlia leaf first elaborated the sap at the very point where it was needed to form a bud, and at the same time applied the necessary means to enable its development to take place with ease. The common Polk weed *(phytolacca decandria)* resembles the dahlia both in structure and economy, as well as many others.

We will now proceed with the leaf of the apple tree. This leaf is also globrous above and pubescent beneath, and its use is similar to that of the dahlia, to wit: the formation of buds for the ensuing year, as well as the elaboration of the sap. Take a twig in the month of June, before the buds are formed, and pluck off every alternate leaf, and you will find no buds will be formed where they grew, while at the foot of those left on, buds will be formed. They have also another very important duty to perform, which is the formation of wood. We see that trees which are crowded together, as in a closely planted grove, grow tall and slender. Why? Because only the leaves on the topmost [illegible] branches [illegible] ys, consequently [illegible], which is added to the [illegible] op, and the tree becomes [illegible] It cannot be urged, that they [illegible] ere, because it is as plenty at [illegible] om of the tree, as at the top. [illegible] use for it, however, which is, that [illegible] ad not access to the sides of the tree to evaporate the redundant water from the sap, but only at the top. But to place this fact beyond doubt, we find the same thing to occur when a tree grows by the side of house or wall. The greatest growth always takes place on the side of the tree opposite the wall or house It cannot here be urged that the house stole the carbonic acid from the tree, as some have said, the trees in a crowded state get a scanty supply except at the top. It certainly is evident, that if the leaves absorbed food, they could as easily get a supply on the side next the house, as on the opposite side, and its growth would be uniform on all sides, for the air circulates as freely there as on the other side. But the reason why it grows only on the exposed side is, that side is exposed to the direct rays of the sun, which, as I have before stated, evaporates the sap more readily, and thus forms a rapid growth of wood, while the side contiguous to the house or wall is shaded, and is deprived of the benefit of the direct rays of the sun, and consequently is feeble and spindling. The formatiton of the annual concentric circles of wood, we observe in the trunks of trees, appears to be by the evaporation of the sap through the surrounding bark. If you will take the trouble at this time to cut a chip from a growing chesnut tree, and separate the bark from it carefully, you will see the commencement of the layer, sap vessels or tubes, which open directly under the bark, and pour their contents out there, which soon forms mucilage, or in other words, the cambium, and finally perfect wood. The leaves, in the mean time, have been daily adding the same substance to the ends of the twigs. In short, the evaporation of the sap through the medium of the leaves, adds new wood to the ends of the twigs, while that through the bark, to the circumference.

I do not pretend that there are no plants that derive their nourishment from the atmosphere through their leaves. The *sempervirum tectorum* may be one of them, for aught I know. In my former communication I wish to be understood as alluding to common plants and trees of our country, and the mass of vegetation, rather than those of very peculiar and unusual habits and structure.

Of all the experiments that I have seen described in relation to the source and method plants employ in acquiring carbon, none have been performed to my satisfaction. Prof. Daubeny performed several, as he says, showing that plants absorbed carbonic acid through their leaves. Although conducted with great care, a very differrent conclusion may be drawn from them than those he arrives at. He introduced under a bell-glass, a pot containing a plant, cemented or ccaled the bell-glass around the edges by mercury, or otherwise, to a plate of iron, and then added five or six per cent. of carbonic acid to the atmosphere enclosed in it, which was absorbed through the leaves of the enclosed plant, as he says. We say it was absorbed through the roots, as they had as ready access to it as the leaves.—Again—he says he introduced the branches of the common lilac *(syringa valgaris)* into a jar, containing six hundred cubic inches of air, mingled with five or six por cent. of carbonic acid, as before. On the first day no perceptible alteration was noticed in the air, but on the second day the oxygen had risen 26.5 per cent., the next day it had sunk to 26.0, but by 2 p. m. it had again risen to 29.75, and by sunset had risen to 30 per cent., and then again sunk as before one-half per cent. Now this proves nothing more than that the plant experimented upon expired oxygen, and probably all the elements of water, which diluted the mixture of carbonic acid with the atmospheric air, so that there was an increase of 30 per cent. in favor of the oxygen, instead of a diminution of carbonic acid.

Again—you will observe that none of the plants experimented upon, survived longer than two or three days, while subjected to this mixture, and had he used less carbonic acid, I have little doubt they would have lived longer, and that the less the quantity the longer they would have lived. Others have plucked off the leaves of plants and immersed them in water containing carbonic acid, and affirm that it was absorbed by them, which I shall not dispute or doubt—the ends of the leaf stems which have been broken off, doubtless absorbed it, as we would reasonably expect, it being the proper avenue for it. I have never been able to make a branch, without being detached from the plant or tree, absorb carbonic acid, when introduced into it, or a mixture of it with atmospheric air; although I find an increase of oxygen precisely as did Professor Daubeny, and producing simply a relative dfference of proportions of gases.

I believe Prof. Johnson has pretty well exploded the doctrines of Liebig in this respect, and that his theories are received with much doubt of their correctness, and will probably be altogether abandoned by practical agriculturists and chemists, after a trial. I was not aware that the air on the lee side of a corn field, differed from that on the windward side. If so, it would seem that it had been applied by the corn in some manner unknown, to its own use. I, however, think it a very nice experiment to perform, as the atmosphere only contains, ordinarily but 1-10,000 part carbonic acid, if my memory serves me, and it would require great accuracy in the analysis to detect a difference in the small portion that could be experimented upon, consequently it should be received with much caution.

Many plants have leaves covered with a downy or dusty substance, these convey moisture to the stem and roots, by means of capillary attraction; many of them having pendant leaves. Most leaves, however, are varnished as it were on the upper side, that the water may the more readily run off. Had leaves been intended by the Creator as the recipients of food for the plants to which they are attached, they would have been placed, as Dr. Franklin said a man's nose would have been, had it been intended as a receptacle for snuff, to wit: the other side up.

I have candidly given you my reasons for doubting the hypothesis, that plants receive their carbon through the medium of their leaves; whether well founded, or not, I leave to the more scientific and discerning to determine, hoping

that I shall not be the means of causing one blade less of grass to grow, than would otherwise have grown, had I not doubted and condemned the theories of Prof. Liebig.

Your truly, J. VAN BUREN.
Clarksville, Ga., April 8, 1851.

Light---its influence on the growth of Plants.

A HIGHLY respected correspondent makes the following enquiry:

"Cant you give us an article on the influence of light on the growth of plants? —thus indicating the advantages of planting certain crops at particular stages of the moon."

There is, we believe, in the minds of Vegetable Physiologists, no doubt of the chemical influence of *solar* light in the elaboration of the sap of plants. The most convincing and satisfactory experiments have been made by De Condolle and others, all going to prove the fact.—But that as much can be said of *lunar* influence, or indeed of any influence whatever of the moon on plants may, we think, most reasonably be doubted.

We shall be pleased to hear from some of our able correspondents on this subject. At present we make the following extract from an interesting essay on vegetable physiology, by Geo. D. Armstrong, Prof. of Nat. Philosophy and Chemistry in Washington College, Va.

"We are now prepared to discuss the question, by what means are plants enabled to effect the elaboration of their sap. As that sap enters the root, it is a thin fluid consisting principally of water containing carbonic acid gas in solution; from the raw material, in some way or another, plants are enabled to form all the components of the vegetable structure, the wood, the starch, the sugar, the gum, the oil, the resin, the acids, &c.—The question is, by what means is it that plants are enabled to effect these changes. To give a full and complete answer to this question, is impossible in the present state of our knowledge of vegetable physiology; yet there are some facts which have been ascertained by experiments carefully performed and often repeated, which it may be important to the practical agriculturist to know.

The most important of these is, that many of those chemical changes which constitute what is termed the elaboration of the sap, are effected through the agency of solar light, or if not by its direct agency, it is necessary to enable the plant to effect them. How it is that light is able to change the chemical relations of substances, so as to cause those to combine, which would otherwise have remained separate; or to cause those to separate which would otherwise have remained combined, is a matter of which no satisfactory explanation has ever as yet been given; and yet there is no fact in chemistry which is better established than that it does act in this way. If a bottle, partly filled with nitric acid, be set away in a dark place, it will undergo no change; but if it be exposed to direct sun-light, a decomposition of a portion of the acid at once commences, and the whole of the upper part of the bottle will soon become filled with a mixture of oxygen and nitrous acid. If a mixture of equal volumes of chlorine and hydrogen be enclosed in a bottle, and light be carefully excluded, no combination will take place, it matters not how long they be thus kept mixed; but if the mixture be exposed to diffuse day-light, the two gases will gradually combine, and form hydrochloric or muriatic acid; if the mixture be exposed to direct sun-light, the combination takes place as instantaneously, and with as violent an explosion, as if caused by the contact of flame or by the electric spark. These facts, and numerous others of a similar character, which might be mentioned did it seem necessary, establish beyond question, the principal that light does possess the power of so altering the ordinary chemical relations of bodies as to cause combinations and decompositions which otherwise would not take place.

The principal agency of light appears to be exerted in effecting the decomposition of carbonic acid, and in fixing the carbon thus obtained, in the tissues of of the plant. Some of the evidence on which this statement rests, have been given in a preceeding chapter;* I will here add only a few remarks of De Candolle, in which he has embodied the results of numerous experiments performed by himself. "If" says he, "two plants are exposed, one to darkness, and the other to the sun, in close vessels and in an atmosphere containing a known quantity of carbonic acid, and are removed at the end of twelve hours, we will find that the first has diminished neither the quantity of oxygen nor of carbonic acid; and that in the second, on the contrary, the quantity of carbonic acid has diminished, while the quantity of free oxygen has increased in the same proportion. Or if we place two similar plants in close vessels in the sun, the one in a vessel containing no carbonic acid, and the other in air containing a known quantity of it, we shall find that the air in the first vessel has undergone no change, while that in the second will indicate an increase of oxygen proportioned to the quantity of carbonic acid which has disappeared; and if the experiment is conducted with sufficient care, we shall discover that the plant in question has gained a proportionable quantity of carbon. Therefore, we conclude that the carbonic acid which has disappeared, has given its oxygen to the air, and its carbon to the plant, and that this effect has been produced solely by the action of solar light." All the experiments which have hitherto been made, lead us to the same conclusion that solar light is absolutely necessary to plants, to enable them to digest the crude matter which they obtain from the soil.

"The fixing of carbon by the action of light, contributes in an eminent degree to the quality of timber; a point of no small importance in all countries. It is in a great degree to the carbon incorporated with the tissue, either in its own proper form, or in combination with other elements, in the form of resinous or astringent matter, that difference in the quality in the timber of the same species of tree is principally owing. Isolated oak trees, fully exposed to the influence of light, become tougher and more durable than the same species growing in dense forests; in the former case its tissue has become solidified by the greater quantity of carbon fixed in the system during its growth. There is every reason to believe that the brittle wainscot oak of the Black Forest, Eng. is produced by the very same species as the solid naval timber of Great Brittain." The results of chemical analysis confirm this opinion, as will be seen by noticing the quantity of carbon obtained from different kinds of wood, as given in the following table.

Cormonna-wood	55	per cent. of carbon.
Iron-wood	53.44	"
Oak	52.50	"
Beech	51.45	"
Box	50	"
Willow	49.80	"

"It is to the power which sun-light possesses of decomposing carbonic acid, and fixing the carbon in the tissues of the plant, that the direction which the branches of a tree assume, is generally to be ascribed. When a branch first protrudes from a stem, its own weight would bend it downwards, if it were not for the effects of light from above, which solidifies the part exposed to it. Let any one expose a green branch in such a way that light strikes it only on one side; the tissue on that side will fix the most carbon, become harder and lengthen less; while the tissue of the opposite side, fixing less carbon, will harden less, and lengthen more; the consequence of which will be that the branch will be eventually turned towards the light. This will explain the uniform tendency of the green parts of plants to turn towards the light."

Besides fixing simple carbon in the tissues of a plant, light appears to exert a very important and necessary agency in the production of many of the proximate principles of vegetables. Of its influence in the production of the various kinds of coloring matter, and also of the odoriferous principles, I have already spoken, when treating of those subjects,

*It has long been known that a ray of solar light was composed of three distinct and separable rays, viz., a luminous ray; a heating, or, as it is more commonly called, a calorific ray, which is not luminous; and a chemical ray which is neither heating or luminous. By a certain contrivance, it is easy to absorb any two of these rays, while the third is suffered to pass on undisturbed. By subjecting a plant to each of the three rays in succession, it has been found that it is the chemical ray alone which is capable of producing any effect. The facts should be borne in mind by any one who may wish to repeat the experiments of De Candolle.

To the formation of starch, a substance into the composition of which carbon enters very largely, sun-light appears to be necessary. It is to the starch which they contain, that potatoes, corn, and many other plants, owe most of their nutritive properties. Potatoes grown in the dark are always watery, in consequence of no starch being developed in them; and indeed the quantity of nutritive matter which they contain, is, in other circumstances, propotrioned to the intensity of light to which their leaves, (the organs in which the elaboration of the sap is principally effected,) are exposed. When orchard-ground is undercropped with potatoes, the quality of the potatoes is never good, simply because so large a quantity of light is intercepted by the leaves and branches of the orchard trees, as to retard the formation of starch. The formation of the milky juices of many plants, appears to depend upon the presence of solar light. As these milky juices are frequently poisonous,, it is a mattar of great importance to prevent their formation, where the plant is intended to be eaten. Hence the common practice of blanching, as it is called; which in fact is nothing more than excluding the sun-light from the plant, to prevent the formation of certain substances which would have been produced had sun-light had free access to the plant. Hence too, the safety with which the young shoots, which have just protruded from beneath the ground, are eaten, when the same plant, if eaten at any subsequent period of its growth, would have been highly deleterious.

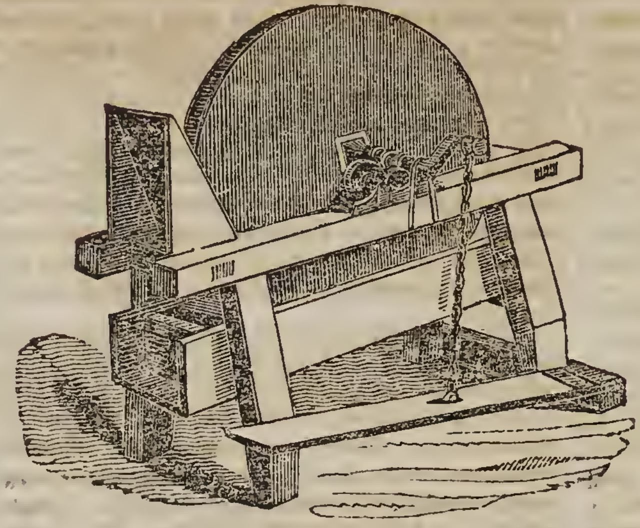
From the Working Farmer.

Potatoes and Tomatoes.

It is not so generally known as it deserves to be, that the tomato, when grown among corn, is far superior in flavor to those grown in the common way. They must of course have a fair chance of room to grow, and not be too much crowded by the corn. Those who can appreciate the good qualities of this vegetable when in perfection, will find this mode of growing them to secure all they can ask; at least such has been my experience.

It is maintained, by some respectable experimenters, that potatoes planted among corn are not so liable to rot; and this opinion has been confirmed by a sufficient number of trials to render it worthy of attention.

The soundness of potatoes in these cases, and the superior flavor of the tomatoes mentioned above, are probably owing to the same cause, which is, that corn, from its superior powers of attraction and assimilation, approximates to itself the soluble nitrogenous matters contained in the soil, and thus prevents the less energetic plants in its neighborhood from absorbing those compounds of nitrogen which experience has shown to be highly injurious to the quality of their products. The best potatoes are those which contain the largest proportion of starch, and this is but carbon and the constituents of water in another shape.



[GRINDSTONE.]

Grindstones—These are now generally hung on friction rollers, and are moved with a treadle. The person grinding can thus turn his own stone without assistance.

The friction rollers render the movement of the stone very easy.

[*A. B Allen's Catalogue.*

Azotized manures, which are found so essential in the cultivation of grain, are, on the contrary, detrimental when absorbed into the circulation of a plant which does not require them for the perfection of its products, and which is, in fact, unable to digest such concentrated nutriment. Every one knows how much inferior the sweet potato becomes when grown upon clay soil; and Liebig speaks of a peculiar kind of turnip, which, under the same circumstances, loses all the good qualities for which it is noted when cultivated in sandy land.

Those plants in which compounds of carbon predominate, may be said to form a lower grade, in the scale of vegetable life, than that occupied by those containing more nitrogen. The former are the unassisted products of nature—the forests and the wild grasses with which a fertile country is covered, before the busy hand of man has entered upon its labors; and the latter are the golden harvests which his skill and industry secure, to increase his comforts, or add to his wealth.

A portion of nitrogen is undoubtedly necessary to all vegetables, but it is equally certain that we sometimes apply more of the substance than is required to produce the best results. If we admit, with Liebig, that "plants absorb all the soluble matters present in the soil, as a sponge absorbs water with all that it contains in solution indiscriminately," we must be impressed with the importance of adapting the supplies of food to the necessities of the plant, and of withholding, as far as possible, that which is useless or detrimental.

It is said of the Chinese, that they manure the plant more than the soil; and certainly, to do this understandingly and effectually, implies the perfection of the highest accomplishment within the ambition of a scientific farmer.

Pencillings by a Planter---No. 3.

Messrs. Editors:—When we reflect on the magnitude of the principles involved in agriculture, affecting generations of our race, yet unborn, extending into indefinite time, embracing the highest hopes of man's intelligence and civilization, we think we present sufficient apology for intruding on your readers our remarks.

South Carolina in its primitive condition presented on its area a large proportion of fertile soil, possessing within its geological limits three distinct floral regions, climatically fitted for the production of nearly every animal and vegetable required for subsistence, and even luxuries, to gratify the tastes of refined life.

The time is not very remote when the plow and the axe had not broken the soil or felled the forest, when the beauty of the wooded landscape was unmarred by gullies, and barren old fields covered with flinty broomsedge—the chronicler of the folly of our destructive system of agriculture.

The continued fertility of the soil is of the greatest interest—it concerns every man no matter what may be his occupation—the blacksmith at his anvil—the miner in the deep bowels of the earth, and the hardy tar whose home is on the perilous deep, are all equally interested, in the continued and increasing fertility of the earth's surface. This being the fact, what language can we use sufficiently condemnatory of a system of agriculture, marching onward, extinguishing under its footsteps the fertility of the soil, leaving a desert behind, making future operations for recovery, if not altogether impracticable, approximating closely that condition.

We expect to call down on our head some unmeaning, yet very fashionable epithets, for our attempting to make comparisons, but we shall not wander to the land of wooden nutmegs, but will rest satisfied within the limits of our own much abused, though once lovely Carolina; nor do we fear contradiction, when we assert that an impoverishing, spendthrift course has been pursued by the planters of this State, sufficient we think to arouse intelligence to the investigation, as it needs no prophet to foretell that this destructive state of the soil must have an end; and no lover of his country, and the well being of his fellow man, but what should lend a willing ear and a helping hand to arrest these downward tendencies. The question is one of time alone, and not of fact, to say when the whole state will be reduced to sterility. These statements may be the subject of ridicule, but that will not invalidate the truth of the matter. Change in public sentiment is the only hope. Ignorance with its attendant traditions and prejudices must be broken down, and the one idea system of agriculture must be uprooted. The wearing-out and im

poverishment of the soil, serves more to alienate man from the land of his birth, in this country, than all the acts of government have achieved.—When man loves his home he loves his country, and a home to be loved, must be in a bettering condition, which gives status to its owner, with growing contentment. Agricultural journals and societies can do much to enlighten, ameliorate and amend, the present condition of the soil. As Carolinians, we possess many advantages in climate and productions; but, so far, we have proved unworthy of these blessings, and have persevered with blind adhesiveness in barbarously murdering the soil, recklessly impoverishing every thing around, to call down the curses of future generations, by thus wasting the elements of subsistence. Nature will vindicate her violated laws, and whoever abuses the gifts of a generous soil must sooner or later pay the penalty. How much of the once beautiful faced country of Carolina now lies in almost irretrievable ruin? If now and then a farm presents that is in a bettering condition, it is like an oasis in the desert, and were we not afraid of offending your fair Beaufort correspondent, we would say Carolina "wears a ragged appearance." Let the denuded, water-worn and gullied old fields, endorse the assertion. Blind, indeed, is he who fails to see this work of destruction.

We assume the value of land is entirely independent, and far above its marketable price; and no matter if the original cost of land was but ten cents an acre, if the fertility be destroyed, an equal injury is done to the world, as if it had cost one hundred dollars per acre—in a word, the price of land has nothing to do with its intrinsic value.

Animal beings are destined, under a law of nature, to perpetual increase. Nor is man exempt. This being acknowledged, what should be the end and aim of the agriculturist? Most eminently it is his duty, not to diminish, but to increase the capacity for production.

Lands have deteriorated in this State more by washing away, than by all other influences.—We are not among those who can see that solar rays ever injure the earth's fertility. The earth undisturbed by tillage is every where fruitful, except where geological formation, or excess of some mineral, forbids. Plants grow without tillage—plows and hoes are civilized utensils.—To prevent lands from washing away, is the most important object, which the intelligent agriculturist can bring to bear in his operations for improving the soil. In the South the meteoric order of things is such, that more than double the quantity of water falls in a given time, than in more northern latitudes. The writer of this article measured three and two-third inches that fell from one cloud in the course of a few hours; and even in January, one and eight-tength inches fell on the 22nd and 23d; two years ago five inches fell in one day. To find how to meet these sudden floods, and to dispose of the water harmlessly, calls upon the inventive genius of the Southern agriculturist, and we are happy to state that many of our thinking planters are at this time engaged in this necessary business of trying to prevent their soil from mechanical washing, and we have been cheered this winter and spring, by seeing several farmers engineering their slopes and hill-sides, forming ditches with gentle inclinations to carry off the surface water. This is the dawn of a better day—human toil was never better spent, than when employed to prevent the destruction of the soil.—Patriotism calls loudly, benevolence and imperious obligation to the well-being of millions of our race yet unborn, are the incentives to the work. Then Carolinians up and be doing!—Shake off the thraldom of ignorance—awake to the light which science in its onward march clusters around you—step manfully into the breach, and make a strong, well-directed and continued effort, to arrest the destruction of your broad acres, nor ever stop the good work, 'till every denuded part of your fields smile with promised harves, and every unsightly gully presents an even surface to the plow; bring art, and science, and industrial energy to bear upon the work—then will the land be filled with plenty—a growing love of home will be barriers to emigration—harmonious beauty will play over the landscape, and in this onward career, man will approximate his high destiny. There is nothing utopian in the picture, it is a reality which the mind and energies of man, if legitimately directed, can accomplish.

This is an age in which physical science, has outstripped the wildest fiction. One development has scarcely sounded its triumph through the land, ere the mind is startled with another more astounding. Then we would ask, shall the workmen at the base of this stupendous structure be engaged, prompted alone by the "mighty dollar," to remove, stone by stone, the foundation of the great fabric, now rearing by the genius of our race? We say no! emphatically no! Every principle forbids the barbarous act; then we say, workmen to the rescue, place back every stone, and as the fabric towers to the skies let the base extend to the earth's extreme verge. Can this be done? We answer, it can. We know it is beyond the genius of man to create one particle of matter, or add one atom to the volume of the earth, but he has the power to secure and promote the productiveness of the soil. To achieve this his prejudices must be uprooted, the aids of science must be called in, and the mind of the agriculturist must be illumined by the humanizing light of its giant powers.—Knowledge must be radiated from the few to the many, 'till every farmer and every mechanic has a store in himself, ready for useful and active operation in the field and the workshop; hand in hand should art, science and industrial energies march in the great high way of man's destiny, and thus rear our race far above its present condition. Pestilence, with its awful results, is the creature of vice and ignorance. Famine, in all its haggard phases, is the result of wrong doing and disobedience to laws fixed in the constitution of nature, by a beneficent providence for the wisest purposes. J. P. B.

[TO BE CONTINUED.]

Review of the March Number.

MESSRS EDITORS:—Will you indulge us in a few words on the March Number.

"*Report on Fruit.*"—Very good: we trust the many good things upon this subject, in your Journal of late, are ominous of a better taste in the selection and cultivation of this luxury of life.

"*Mixed Husbandry*,"—Dr. Philips cannot evince too much zeal in this cause. It is a noble one, and worthy of all the talent which can be arrayed in its support. It is high time that the people were growing tired of political humbuggry, and turning their attention to home and its improvement. There is no part of this broad earth, susceptible of greater improvement than the South, and of all the South, there is no spot where it is more needed than in South Carolina.—We have no idea of the vast resources of the State, of the virtues and capabilities of her citizens, nor can we ever have, unless we give up politics, for a living, and devote some of our energies to the home department.

"*Corn Culture.*"—Verily here is a fellow who runs the thing into the ground in earnest. Well, we have no objections to his deep plowing, the first time, and under certain circumstances, might be induced to subscribe to the second, but we cant go that third plowing, which is to cut the young roots and go in search of more food for the stalk. There may be some sense in root pruning fruit trees to prevent a too luxuriant growth, but we can see very little use in root pruning corn, provided the weeds and grass can be killed without it. There is certainly some time lost in that second growth of the stalks, to say the least.

"*Mr. Junius Smith's Letter.*"—Mr. Smith has roused up a tart customer, and got about such a rubbing as he deserved.

"*Food of plants.*"—We are glad to see as good authority as Mr. Van Buren, arrayed on the side of organic manures.—And here let us take occasion to remark, *again*, that we do not deny that benefits arise from the use of inorganic manures. They are very good things in their place, and always *better* when organic matter is abundant.

"*Capillary Attraction.*"—A very sensible article. We hope to see many such from "Pendleton." It is by simplifying science we must expect to reach the back country farmer.

"*Guinea Grass.*"—De gustibus non est disputandum. We have witnessed its operations enough for our own satisfaction.

"*Meteorological Observations.*"—Joachim is right—too little attention is paid to such things. A series of experiments judiciously conducted, by intelligent planters, might lead to important results.—How many planters have answered Lieut. Maury's circular?

"*Dew.*"—Mr. Van Buren seems to have got into warm water with his new theory of dew. We take it, that he is able to take care of himself.

"*Spent Tan Bark.*"—A capital article, and in good season—friend G. look to it.

"*Barren or unfruitful Soils.*"—"I." speaks sensibly and to the point. Our doctrine is, as we have again and again said, that it is not this or that particular salt in abundance that makes fertility, but the presence of all required by the plant.

"*Corn Planting.*"—Notwithstanding we have the heavy weight of Dr. Philip's opinion against us, on this subject, we are strong advocates for open planting, in this latitude. We have never been able to succeed by close planting in any land. We have seen fields, in Narcoochee Valley, that would yield an average of forty bushels to the acre, planted 4½ by 4½, two stalks to the hill. As to the use

of the sub-soil plough, there can be no doubt, it is the best plough in the world for the first working.

"*Source of the fertility of lands.*"—Pry is down upon Broomsedge again, and seems to be somewhat annoyed by "his great tenacity of life, and extraordinary power of vitality." A professional woods burner should know that Broomsedge always improves under that operation.—We are not disposed to go into a discussion about the rules of grammar or verbal criticism, if we have misunderstood Pry, it has not been intentional, and many others seem to be in the same dilemma. Pry quotes from Bakewell: "by a provision of the author of nature, it is ordained that those rocks which decompose rapidly, are those which form the most fertile soils, for the quality of soils depends on the nature of the rocks from which they are formed." Granted—but from this fact by no means follows the corollary deduced by Pry. We don't care how rich the inorganic remains may be, it can never make a fertile soil, till organic matter in larger quantities is added. "Poor and hungry soils," says Sir Humphrey Davy, "are commonly produced by the decomposition of the granite and sandstone rocks, such soils usually remain for ages, with only a *thin covering of vegetation*. The soils produced by the same gradual means on the limestones, chalks and basalts, are often clothed by nature with the perennial grasses and afford, when ploughed up, a rich bed of vegetation for every species of cultivated crops." If sir Humphrey be correct, it seems to us madness to be annually burning off *granite* mountain soils.—Where there is present an abundance of the salts of lime, a constant and rapid decomposition (the eremacausis of Liebig) will be kept up without the aid of fire, and this is the case generally in the fertile lands of the West and Virginia so eulogized by Pry.

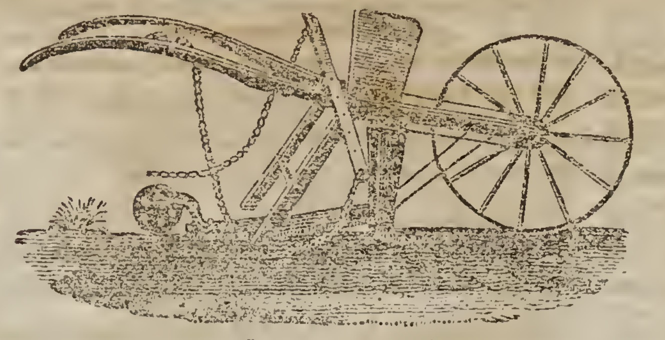
Since Pry complains of our thrusting a series of analyses in his way, we will spare him on this point, but we would like to know where these inorganic manures come from; do they come from the decomposition of rocks, minerals, &c.? Where do we find this mass of decomposition? It is in the subsoil, or it is in the plant, or it has gone to the winds and waves. If the subsoil of A's farm was originally formed out of the debris of rocks rich in lime, potash, soda, &c., it contains these salts still, or Prof. Way's new discovery is all humbug. And if the sub-soil of B's farm was originally formed from the debris of rocks deficient in such salts, it is vain to think of enriching it, by any means save the addition of the inorganic materials needed.—It can never be done by burning the woods.

Dr. Jackson is certainly good authority. "Potash," he says, "renders most of vegetable humus soluble in water, consequently it produces a very marked and powerful effect, rendering vegetation for a while extremely luxuriant; but the evils that follow from a too free use of this substance are very great, for the soil in a few years is deprived of its vegetable matter, and is rendered barren. There can be no doubt that a burnt soil soon runs out or becomes barren by the conversion of the humus into soluble matter, so that it is lost by infiltration."

Pry has evidently cooled down considerably on his burning mania, and we do not altogether despair of having his able pen enlisted on our side yet, notwithstanding his warm declarations in the conclusion of his last, which reminds us forcibly of a scene we once witnessed.—An Irishman had been sprawled in a fight, and his adversary, who was a good hearted fellow, held Pat down some time without hurting him; when he thought he had got cool, he let him rise, but imagine his astonishment, when Pat bracing himself exclaimed, "now d—n your eyes, I give you a fair chance to run."

Yours respectfully, BROOMSEDGE.

Improved Brush Seed-Sower.



[SEED-SOWER.]

This machine, with all its essential parts, has been long in use in this country and in England, and is found to be the only one that plants all the variously formed small seeds rapidly and with precision. The annexed cut represents the machine with the hopper and apparatus for sowing the small garden-seeds, such as onions, turnips, carrots, parsnips, beets, &c.; and also millet and other small grains, in drills. It is easily arranged to plant a greater or less quantity, as may be required.

By substituting another hopper, which fits in the place of the present one, when removed, and with different dropping fixtures, peas, beans, corn, &c., may be planted in drills, or in hills from six inches to two feet apart. It is but a moment's work to exchange one for the other, and in this, the quantity of seed planted is easily regulated.

The operator moves forward as with a wheel-barrow, when the drill is opened, and the seed is deposited, covered, and the soil compressed at a single operation.—An acre, with rows two feet apart, is easily sown in three hours.

[*A. B. Allen's Catalogue.*

Kitchen Garden for May.

WRITTEN FOR THE "FARMER AND PLANTER."

PLANT bush and pole beans for a general crop. Set the poles and then plant the beans around them; or sow them in a single row along a border on each side of a walk, and let them have the support of a slight trellis. Plant winter beets if not alreadey done; sow cabbage seed for fall and winter use. Plant celery in trenches for early crop; as the plants advance, draw dirt to them, being careful not to cover the bud. Sow celery for late crop. Sow cucumbers during this month for general crop; having dug and smoothed your ground, lay it off into squares six feet each way; in the centre of each, dig a hole twelve or fourteen inches deep, and fill it with well rotted manure; sow five or six seed upon it and cover lightly, after the plants show two or three rough leaves, pluck out of the hill all but the *most thrifty*.

The fly often proves very destructive to the cucumber, melon, &c.; they may be destroyed by sprinkling the plant with soot or ashes, or with a mixture of tobacco water and pepper; an infusion of elder leaves, walnut leaves and hops has also been recommended. Cucumbers being climbers by means of their tendrils, will ascend and produce fruit at a distance from the ground. The writer, of this, trained cucumbers over a slight frame work which grew finely and produced an abundance of beautifully formed fruit, of a clear growth, free from spots, and well flavored; and a gentleman of Philadelphia enriched the ground near a peach tree, planted seed and permitted one plant to run up the tree, which bore one hundred and fifty cucumbers.

Set out egg plants in a rich warm piece of ground, at the distance of two feet and a half asunder, each way. Keep them clean, and draw a little earth to their stems and they will produce an abundance of fruit.

Continue to sow lettuce for summer and fall crops. Plant a succession of melon crops, leaving but one or two in a hill. If the weather should be dry, water them frequently and plentifully. Soap suds will be found beneficial in destroying a small yellow bug, with which melons are infested, and in promoting a rapid growth. Sow okra in drills an inch deep and four feet apart, and, as it advances in growth, hill up. You may still continue to sow parsley. It has been recommended to soak the seed twelve hours in water mixed with sulphur; this process will cause the seed to vegetate more rapidly. Peas may be sown every ten days for late crop, the best variety for this purpose is Knight's marrowfat. If dry weather should set in, water abundantly. Plant out peppers sown last month. Sow succession crops of radishes once a fortnight. Set out tomatoes in beds in rows three feet distance every way; let them have the benefit of a slight trellis, or provide some small bushes upon which they may climb. Gather, during this month, mint, balm, sage &c., if nearly at full growth. Do not dry them in the sun. Keep all your crops clear of weeds. There is great advantage to be derived from continually stirring the ground; it keeps the soil open and porous and thus retains more moisture, enabling it to bear drought, thus affording more nourishment to the plant. HENRY.

Subsoiling.

How many of our subcribers have used the subsoil plow in the preparation of their land for the present crop? Allow us to advise such as have not, to use it now, when plowing their corn for the first time; or, if they have already plowed the first time to use it at the second plowing. Recollect we have had a great deal of rain this spring, as we had last, and remember that we advised you last spring to use the subsoil freely in anticipation of a drought; and we have no doubt you that did not use it, have a *feeling* recollection of how much corn you made. If you have not, just step to your crib and venture to take a peep at your diminutive pile lying at the extreme back end—with, perhaps, a few ears stuck in a high crack, in sight of the road, to make passers-by believe your crib is full—as I found to be the case (as I suspected) at a friend's house in Cass county, Ga.—and it will reveal the sad tale.

Some that did take our advice last spring, have acknowledged to us that it was salutary. They are not corn buyers now. If you cannot spare two horses to subsoil your corn, use the one-horse subsoil gopher; let it run in the track of another plough, as deep as your horse can pull it. Do this, and you need not much fear the drought that we are yet going to have before corn is made.

New Patent Loom.

To those who have so long been preaching up the duty of patronizing home industry and home ingenuity, an opportunity is now offered in the new Power Loom lately patented by Mr. John Wilson, of this District. Mr Wilson has his loom completed and in successful operation, a beautiful model now being exhibited in this village. After years of patient investigation and labor, the inventor has the proud satisfaction of realizing his most sanguine expectations, and can safely say, that it is a vast improvement on the ordinary power loom, both in simplicity and durability, and, we understand, will turn out from one to three yards, per hour, more cloth when worked by hand, than the common loom driven by water. We hope our citizens will not permit this valuable improvement to pass unnoticed, or this ingenious native mechanic to go unrewarded. He is now ready to furnish his looms at short notice and on reasonable terms. Any female can weave from thirty to forty yards of plain cloth, per day, with scarcely more labor than she now bestows on weaving six or seven.—*Anderson Gazette.*

Red Ants, can be kept out of closets and other places by impregnating the air with camphor, as this odor is offensive to all the insect family.

Our Correspondents.

If we were to publish every letter received from our friends, complimenting and encouraging us in our enterprise, we might thereby occupy a large space in our paper for each month. But as such letters are usually intended by the writer to be private, we take the liberty of publishing but few of them, and they only such as are best calculated to affect others, by their appeals to the doubting and wavering part of our subscribers, if any such we have, and by encouraging those that are not subscribers to become such—for we doubt not there are many persons that read our paper and approve it, that are restrained by the preponderating influence of the "mighty dollar," from subscribing. Such would prefer borrowing from a good neighbor, and thus filch from us the products of our unrequited labor.

The letter we take the liberty of publishing below, was sometime since received from a gentleman in Abbeville district. It having been mislaid will account for its late appearance:

Abbeville District, S. C.,
February 19th 1850.

Messrs. Editors:—I have received so much benefit from your admirable journal, that I shall continue my subscription to the second volume. The planters of the South, and especially of this State, will be very much at fault, if they permit this excellent promoter of *Southern* agriculture to expire for the want of support. If its guardians, proper, desert it, and leave it to a precarious existence, how can it be expected to survive? My sincere desire is, that, your bantling may grow more and more, until it becomes a "perfect" man, and assert its equality among the most successful and popular journals

I send you $5, you will please address, &c. Yours, respectfully, J. H. W.

Plant Tomatoes.

Yes, keep on planting them till midsummer. Recollect the receipt given by "Senex," in No. 5: Vol. I. Since then we have tested its legitimacy. We not many days since dined at the house of a neighbor, at whose table it has been our good fortune to meet with and discuss many good things, (it's a fine thing to have a good wife) when amongst the many tempting dishes set before us, some of which might well have been avoided by a dyspeptic, was one of cooked tomatoes, in all their freshness both in appearance and flavor, as when just taken from the vine. These tomatoes had been prepared secundem artem, by the good lady with our paper laying before her.—That single paper, which cost only eight and-a-half cents, is worth five dollars to any lover of tomatoes. Our better-half has tried many receipts for preserving tomatoes, but none of them will compare with this. It is just as good as our other receipt given last spring for preserv- hams from skippers, which the "bacon man" informs us is the receipt of receipts.

See an article in this number on planting tomatoes and potatoes with corn, from the pen of the able editor of the "Working Farmer." We had observed that the tomato planted with corn or ochra, was better flavored than such as were planted alone, and had attributed it to the partial shade afforded them by the other plants. We think it probable, however; that Prof. Mapes has given us the true cause, for we are informed that the growers of the sugar beet in France, prefer vegetable manures to such as contain much nitrogen, the former causing a greater development of the sacharine principle than the latter.

Alumn Whey.—Made by boiling a quarter of an ounce of alumn in a pint of milk, and strained, is a good medicine for bowel complaints of children. Give a wine-glassful three or four times a-day.

A Valuable Cement for Household Use.—Take new milk, half a pint, and curdle with sharp vinegar; separate the whey, and mix with the curd, the whites of five eggs, beat well; add fine quick lime, and mix till you have a ductile paste or putty. It will stop cracks, and is fire and water proof.

To make Blanc.—Grate 1 pound of old dry bacon, and add 1 pound of beef suet, ½ pound of butter, two lemons, two carrots cut into dice-sized cubes, three or four chopped onions, and just water enough to make a stew; boil about an hour. Some prefer adding a little boiled rice on dishing up, if there is much water remaining unabsorbed.

To Travellers.—A correspondent in *Moor's Rural New Yorker*, an excellent agricultural journal published in Rochester, N. Y., says that alumn dissolved in whiskey will cure galls on horses, caused by the collar or other pieces of the harness. It will prevent galls from forming, or where they have occurred, constant bathing will secure the continued use of the horse, and acturlly heal the wound while in service. Fresh unsalted butter will cure galls on horses shoulders if rubbed on repeatedly.

A Scare Crow that will be sure to kill.—Col. R. B. Johnson, of Canandaigua, N. Y., has invented a plan for destroying crows, that exceeds any thing yet known.

Take hen's eggs, break one end, pour out the white, buy a little strichnine, use a small wire a little crooked, first dipping it into the vial, then into the egg.—Place the eggs so prepared, at different places in your fields, and at early dawn you may see the crows taking a wide circuit in the air, and returning to mother earth mighty suddenly.—*Ex.*

Acknowledgments.

We are under obligations to some friend for several pamphlets, containing the Constitution and proceedings of the Black Oak Agricultural Society, from 1842 up to and including 1849—a Meteorological journal for the years 1847 '48 and '50, kept in St. John's, Berkley, S. C., by direction of the Black Oak Ag'l Society.—A report on manures, read before that Society in 1844, by F. A. Porcher. A memoir from the Black Oak Society, read before the State Ag'l Society, by Dr. H. W. Ravenel. Also, the reports of Dr. J. L. Smith and Prof. Shepherd, on the ash of the cotton stalk, the composition of cotton soils, and the nature of rust in cotton. These are interesting and valuable reports. a part or the whole of which we hope to lay before our readers in due time.

We return our thanks to the Hon. J. L. Orr for two papers of Chinese, and one of East India, cotton seed. Also, to Hon. R. F. Simpson, for Chillian Clover, Italian Rey Grass and Sanfoinseed. These are the first Patent Office seed we have had the honor to receive, since the commencement of the publication of our paper.—We frequently see our exchanges acknowledging the receipt of seed from the Patent Office, and had considered ourselves in the situation of of the hungry boy, who, on seeing some good looking bread in a baker's stall, remarked, "very good looking bread but none of *my* business." We have divided the seed among such of our friends as were disposed to make a trial of them.

A Subscriber, E. R., of Auburn, Ala., writes as follows: "I would be very much obliged to you, if you would give me all the necessary information how to apply lime as a manure to corn and cotton. I have it both slacked and unslacked. How much to the hill. and at what time is it best to apply it," &c. We are due E. R. an apology for not answering him in our last number, but we considered it too late even then, for him to avail himself of the benefits of an application of lime to the present year's crop. It is not usual to apply unslacked lime to the hill; it should be composted with vegteable (not animal) manures, or rich soil, before being applied directly to the growing crop. And such compost should have been prepared as early as January or February, for the present crop. We should prefer, as the cheapest and most expeditious mode of applying lime, to broadcast it, before breaking the land. This may be done very uniformly by checking off the land, say in squares of thirty feet, and to spread on each square one or two bushels, according to the quantity desired to be given—one bushel to the square, would give about fifty bushels to the acre, two bushels. one hundred, &c. We think light applications, with occasional repetitions, best, at any rate the most prudent. But we will give our correspondent better authority than our own on the subject, hereafter, and in time for another crop.

To Harden Steel Without Springing.—Let it be heated as uniformly as possible, and dip it perpendicularly and slowly into the water, so that it may chill regularly on all sides at the same time, and near the surface of the water. If dipped obliquely, the under side will chill first and as it contracts will draw the upper side, which is still soft. When chilled in that condition it is thrown out of shape. The lowest heat at which steel will harden is always the best, as by raising the heat above that point you only open the pores, rendering it more brittle without getting it any harder.

These facts are derived from experience in making small tools, &c., in my business, I am a watchmaker.

D. I. Wells.

This is good and practical information.
[*Scientific American.*

Wheat Bran as a Manure.

We had intended saying something on the subject of wheat bran as a manure for corn, before now, having some time since been informed of two successful experiments; the one by our neighbor, Mr. James Steel, and the other by P. Reeder, Esq., of Rockwell, Pickens district. Having neglected to take notes of the quantity, and how applied, we have not a distinct recollection of either, but think from a half-pint to a pint was deposited in the hill on each side of the corn (tho' not in immediate contact with it) when planting, and all covered at the same time. The land of both, we think, was of a light character, particularly that of Mr. Reeder, which is a light, sandy soil. The experiments were made to ascertain the effects of bran in comparison with other manures—lot and stable manure, was the other kind used, and in the usual quantity, a shovel full to the hill. The result was in favor of the bran, decidedly so with Mr. Reeder, who, although he did not measure the corn, informed us that he believed, and it was so thought by evrey one who saw it growing, the product from the bran was double that from the manure. The difference with Mr. Steele, who measured his, was not so great, yet in favor of the bran.

We, also, attempted a small experiment to ascertain the relative effects of bran and leached ashes, on corn in poor, stiff land. At the time the corn was planted we deposited in the hill on each side, and in the same furrow with the corn, from a tin box holding between a gill and a half-pint—the bran in one row and the ashes in the next row to it, whilst the third one was left without any manure. The row that received the bran, though it did not touch the corn, did not come up as well as the ashed row—it was replanted, however. In the growth of the corn we could perceive no difference between the two last named, they were both something better than the unmanured row. Being from home at the time they were gathered, no measurement was made of the products. We presume there will be no experiments made with bran as a manure on the present crop, as it has all long since gone to help sustain the "sinking fortunes" of our shadows of cows and calves.

The Cherokee Country.

We have received the following P. S. to a letter from a friend in Upper Georgia, and take occasion here to remark, although we differ with our able correspondent, Dr. I. S. Whitten, in some of his views on the Cherokee Country, yet we were so certain that he had gotten himself into a hornet's nest, that we were not disposed to attempt controverting any of his positions. Our neighbors in Georgia are a hot headed people, although they are not *all* "fire eaters," as some of them style us South Carolinians.

"Your correspondent, Mr. Whitten has almost demolished the "Cherokee Country." We fear it will not survive the shock, and a few more such publications will no doubt as effectually demolish his reputation.

I would like to enquire of your other correspondent, Mr. "Broomsedge," in what particular the "Cherokee Country" has been so "very much overrated." Are the gentlemen in the same category—disappointed because they can't buy our "highly calcareous" lands for the same price that they can sell their old red hills?"

Well, we can't say how this may be, but *can* say, that our correspondents are both able and willing to answer for themselves.

Facts about Digestion.

The gastric juice is essential to digestion. It is caused to flow into the stomach as soon as any substance is introduced into the stomach, wheather it be a piece of leather or a piece of beefsteak; this juice contains an acid, and the more indigestible any article of food is, the greater amount of sourness does the gastric juice contain, hence when persons eat something that does not agree with them, that is, not easily digested, they say it soured on the stomach, or complain of heart burn. The use to make of that is, whatever article of food is followed by sour stomach or heart burn, that article is hard of digestion to that stomach and ought to be avoided altogether, at least it should be taken in diminished quantity. But do not forget that different stomachs bear different things; and what disagrees with you to-day may agree very well next week or next month, and the stomach must be humored, however fickle it may seem.

Sometimes, however, shall I not say, nearly always, people eat so much that there is not gastric juice, or acid enough

to digest the food, then it ferments, produces belching, colicky pains, sick stomach and the like, therefore, common vinegar, which has more of the properties of the gastric juice than any other known substance, is often used to great advantage, especially by persons who have weak stomachs, to aid the stomach in digesting articles which are known to be difficult of digestion. Hence vinegar is plentifully used with cabbage, raw or boiled, with cucumbers, &c. Hence too is it that catsups of various kinds are eaten, and sour krout almost digested by the vinegar it contains before it is eaten. Hence too it is, that some cases of loose bowels are cured by eating plentifully of good, ripe, tart fruits uncooked, as they supply sourness to digest these undigested articles of food which give rise to the diarrhœas that are not of a bilious character. Hence, too, a good ripe apple or two, a little sour, after a hearty brekfast or dinner, is advantageous rather than otherwise, provided not much more than the juice is swallowed. The better plan by far, however, is not to eat so much as to require an apple to save us from the effects of our imprudence.—*Dr. Hall.*

To Postmasters.

WILL Post Masters do us the favor not to write with ink, on such papers as they may return to us? The object of having them returned, is to use them in future, should they be needed; but some of them come back to us written on, and otherwise so much abused—by the person to whom directed, probably—that we should be ashamed to send them to a new subscriber, even if we had none others. We have, latterly, written the names of the persons to whom sent, on the the margin of the paper with a red pencil, as it sometimes happened that the narrow slip heretofore pasted around them on which to direct, was, in the hurry of post office business, lost off, the paper consigned to the pile of rubbish, and a notice would come to us that such an one had not received his paper.

If the post master will write the name of the post office on the envelope, with the name of the individual, inside, it will be sufficient.

Our first number of the second volume was sent to all of our subscribers of last year, who had not ordered a discontinuance at the close of the first volume, as well as to many other persons whose names had been given us by their friends, with a request to all such as did not desire to take it, to return, promptly, *that number*, that we might otherwise use it. Some were returned in due time, whilst some others that were refused were not; but instead, a notice from the post master that they were not taken from the office. And even up to this time when we are about issuing the fourth number—one fourth of the volume out—we receive occasionally a bundle of abused papers, or a notice from a post master, that such man does not take his paper from the office! Now this is too much even for an editor to bear, as broad as their shoulders are, and keep himself cool. And we have it to say, editors as we are, that no man who duly appreciates the golden rule of doing as he would be done by, would take two, three, or half a dozen papers from an office, tear and abuse them, cull their contents, and then return them to the office with the declaration that they had never subcribed for or ordered them. We feel under obligations to post masters generally, for their polite attention to our interests, and desire to offend no man, but being editors shall not deprive us of our independence, or of the privilege of protesting against abuse. We will return to our more legitimate ocupation, the hoe and the plow, first.

Disease on Plum Trees.

IT IS welll known that thousands of the most valuable plum trees are killed or the fruit is blasted by an excresence called the *Curculio*, which is supposed to be an insect which fastens on the tree and stings it. A Clevelander has discovered, and as we learn from the *True Democrat*, what he considers a perfect remedy.

The method is to take an old oil cask, and make in it, from time to time, as he wants to use, a strong suds of whale oil soap, (which can be procured of any of the druggists,) and to sprinkle the entire tree, from top to bottom, and the ground under the tree, thoroughly with the suds, twice or three times a week—commencing as soon as the blossoms begin to make their appearance, and continuing it until the plums are as large as a pea. It might be better to follow it until the fruit is about half grown, at about which time the curculio disappears altogether. The suds does not destroy the insect, but the whale oil soap is so offensive to them that they will not approach a tree which is protected by its odor.

He has tried this experiment every year, with a single exception, for many years past, and that every season he has tried it, his trees have been loaded down with nice full grown fruit, and that the season he omitted it, the curculio made such ravages that he did not have forty plums on all of his trees.—*Suffolk Democrat.*

WATERING TREES.—In very dry seasons it is very important to water newly transplanted trees; but the common mode is very objectionable. When the water is poured on the surface, the soil is apt to crack and let the moisture below escape through the openings, so that its utility may often be very doubtful.—Latterly I have applied the water differently. Dig a hole near the trees so as not to disturb the roots, and pour in a pailful. Then draw the loose earth till the hole is filled, and covered up completely, so that nothing wet is visible, and no cracks will ever appear. A tree treated in this manner will not need watering again for a week.

REMEDY EOR DISEASED SWINE.—A few years since, I had a sow with a litter of pigs, one or two days old, taken suddenly sick. When first discovered, she was laying on her side, and would neither eat nor take any notice of her pigs, even when disturbed. I had no expectation of her living one hour, and being no doctor, knew not what to do for her; but having a little croton oil in the house, (I do not know the quantity precisely, as it was nearly all used, except what adhered to the phial, perhaps three or four drops or more,) I mixed it with milk, rolled her on her back, and poured it into her mouth. In two hours she was on her feet, and in three days, apparently as well as ever.—I have given the same kind of oil to hogs that were sick since that time, and believe they have, in all cases, recovered, but in no case with such marked effect as in the above. S. ESBORN.

HOW TO MAKE YOUNG TREES BEAR.—Whoever plants trees with his own hand or causes them to be planted, is commonly anxious to partake of their fruit as early as possible. He watches the first flower-bud, and if the young fruit drops from the bough, experiences great disappointment. To such of our readers as have felt this emotion, it must be a gratification to know how they may force their young trees into bearing so as early to test their fruit. Whoever would have his trees bear at an early age, must cut off about one-third of the new growth from the extremity of a few branches, about the middle of July. This will force the formation of blossom-buds near the end of the branches during the latter part of the season, for fruit the next year. On small trees this process should be applied to but few of the limbs, otherwise the trees will produce fruit which is imperfect or of inferior quality, and may be injured. In this way we have obtained fruit in the third year from the sitting of the bud or graft.

BLOODY MURRAIN.—Mr. Amos Ewing, of Cecil Co. Md., who exhibited his big ox at our last State Show, calls our attention to the following simple cure for this disease, he having saved a valuable animal thereby—we copy from the Albany Cultivator, for Sept. 1841, page 143.

"It is stated, in the Franklin Farmer, that several cases yielded to two doses of sugar, of one pound each, mixed with water. Some animals in the last stages have been cured by this simple remedy."

"I. S. W." has been received and placed on file for insertion.

CONTENTS OF THIS NUMBER.

PROSPECTUS

OF THE

FARMER & PLANTER For 1851,

A MONTHLY JOURNAL,

DEVOTED TO THE AGRICULTURE OF *THE SOUTH*,

AND ESPECIALLY ADAPTED TO ITS CLIMATE, PRODUCTIONS AND WANTS.

THE second volume will commence February 1851. Each number will be mailed on or about the first day of every month in the year, and will contain SIXTEEN ROYAL QUARTO PAGES, printed on new type, in the best manner, and on beautiful strong paper suitable for binding.

The twelve numbers will make a handsome volume of nearly *two hundred pages* in Royal Quarto form, ILLUSTRATED with numerous SPLENDID ENGRAVINGS of Animals of the best breed, Rural Architecture, Fruits, CUTS of the latest and most approved style of Agricultural Implements and Machinery.

The Editors are determined to make it worthy of the South and South-West, and have the pleasure to announce that they will be assisted in the conduct of the Second Volume by many of the best planters in South Carolina, Georgia, Alabama, Mississippi, Texas and Virginia.—It is believed no Agricultural paper in the United States can present the names of an abler corps of correspondents, than will contribute to this during 1851. Its contents will embrace a large amount of original matter, with choice selections entirely suited to the Southern Atlantic and Gulf States.

The increased expenses of this volume which will be incurred by the cost of ENGRAVINGS, CUTS, and PRIZE ESSAYS to make it complete and unsurpassed, and the low price at which it is offered, oblige the FARMER AND PLANTER to make its appeals for that support it merits, to the whole body of those engaged in Southern Agriculture.

Of those who have manifested an interest in the success of the FARMER AND PLANTER, the Editors retain a grateful recollection, and respectfully solicit their further co-operation to enlarge the circulation of the paper.

All who feel a desire that this work should be sustained, and a concern for the advancement of Agriculture are invited to subscribe themselves, and enlist as far as possible the patronage of their neighbors.

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Post Masters throughout the country are particularly solicited to act as agents for the paper in procuring subscribers and forwarding names to the proprietors.

SEABORN & GILMAN,
Editors and Proprietors.

Pendleton, S. C., Nov., 1850.